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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/830,009 | 04/23/2004 | Bily Wang | BHT-3244-48 | 7645 |
| 7590 | 09/28/2006 | | EXAMINER | |
| TROXELL LAW OFFICE PLLC SUITE 1404 5205 LEESBURG PIKE FALLS CHURCH, VA 22041 | | | DONG, DALEI | |
| | | | ART UNIT | PAPER NUMBER |
| | | | | 2879 |

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/830,009 | WANG ET AL. | |
| | Examiner | Art Unit | |
| | Dalei Dong | 2879 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 28 August 2006.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-8 and 10 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-8 and 10 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 23 April 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. The Amendment filed on August 28, 2006, has been entered and acknowledged by the Examiner.

Claim Objections

2. Claim 3 is objected to because of the following informalities:

Regarding to claim 3, the Applicant claims a green phosphor made of $\text{Ca}_8\text{EuMnMg}(\text{SiO}_4)_4\text{C}_{12}$ should be changed to $\text{Ca}_8\text{EuMnMg}(\text{SiO}_4)_4\text{Cl}_2$ should. Appropriate correction is required as well as in the Specification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 1, 5-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Application 1 447 853 to Meada in view of U.S. Patent No. 6,809,471 to Setlur.

Regarding to claim 1, Meada discloses in Figures 1-3, a white light source, comprising: a substrate (7); a near UV light-emitting diode (1) placing on the substrate; a

phosphor mixture (2) coated on the near UV light-emitting diode (1) and composed of a red phosphor (5), a green phosphor (4) and a yellow phosphor (6).

However, Meada does not specifically disclose that the near UV light-emitting diode emits light in the blue color range and wherein the blue light-emitting diode emitting a light having a wavelength from 400 nm to 490 nm.

It is old and well known in the art that the color near UV is blue color. Furthermore, Setlur teaches in Figure 4, a light emitting diode having wavelength near UV-to-blue range and the blue light-emitting diode emits light with a wavelength of 400-490 nm (see column 3, lines 38-40) for the purpose of providing a light-emitting diode having emission in the range of maximum sensitivity to the human eyes.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the near UV to blue emission range diode of Setlur for the white light source of Meada in order to provide a light-emitting diode having emission in the range of maximum sensitivity to the human eyes.

Regarding to claim 5, Meada discloses in Figures 5-7, the white light source is packaged in a surface mount device (the flat display can be surface mounted) is a limitation with respect to the manner in which the claimed apparatus is intended to be employed and this limitation does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations (see MPEP 2114).

Regarding to claim 6, Meada discloses in Figures 5-7, the white light source is packaged in a lamp-type device.

Regarding to claim 7, Meada discloses in Figures 1-3, the substrate (7) is an insulating substrate.

Regarding to claim 8, Setlur teaches the blue light-emitting diode is made of a nitride compound (see column 2, lines 2-5), and the motivation to combine is the same as above.

Regarding to claim 10, Meada discloses in Figures 1-3, the red phosphor, the green phosphor and the yellow phosphor are mixed in a predetermined ratio.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Application 1 447 853 to Meada in view of U.S. Patent No. 6,809,471 to Setlur in further view of U.S. Patent No. 6,680,569 to Mueller-Mach.

Regarding to claim 2, Meada in view of Setlur discloses in Figures 1-3, a white light source, comprising: a substrate (7); a blue light-emitting diode (1) placing on the substrate; a phosphor mixture (2) coated on the near blue light-emitting diode (1) and composed of a red phosphor (5), a green phosphor (4) and a yellow phosphor (6).

However, Meada and Setlur does not disclose the red phosphor is CaS:Eu or SrS:Eu.

Mueller-Mach teaches in Figure 3, a light emitting diode, comprising the red phosphor made from CaS:Eu or SrS:Eu (see column 4, lines 18-27) for the purpose of achieving desirable color balance for a true color rendition.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the red phosphor of Mueller-Mach and the blue light emitting diode of Setlur for the white light emitting device of Meada in order to achieve desirable color balance for a true color rendition.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Application 1 447 853 to Meada in view of U.S. Patent No. 6,809,471 to Setlur in further view of U.S. Patent No. 6,294,800 Duggal.

Regarding to claim 3, Meada in view of Setlur discloses in Figures 1-3, a white light source, comprising: a substrate (7); a blue light-emitting diode (1) placing on the substrate; a phosphor mixture (2) coated on the near blue light-emitting diode (1) and composed of a red phosphor (5), a green phosphor (4) and a yellow phosphor (6).

However, Meada and Setlur does not disclose the green phosphor is $\text{Ca}_8\text{EuMnMg}(\text{SiO}_4)_4\text{Cl}_2$.

Duggal teaches that it is old and well known in the art to use the green phosphor $\text{Ca}_8\text{EuMnMg}(\text{SiO}_4)_4\text{Cl}_2$ in a light-emitting diode (see column 3, lines 13-30) for the purpose of achieving desirable color balance for a true color rendition.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the old and well known green phosphor of

Duggal and the blue light emitting diode of Setlur for the white light emitting device of Meada in order to achieve desirable color balance for a true color rendition.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Application 1 447 853 to Meada in view of U.S. Patent No. 6,809,471 to Setlur in further view of U.S. Patent No. 6,504,179 to Ellens.

Regarding to claim 4, Meada in view of Setlur discloses in Figures 1-3, a white light source, comprising: a substrate (7); a blue light-emitting diode (1) placing on the substrate; a phosphor mixture (2) coated on the near blue light-emitting diode (1) and composed of a red phosphor (5), a green phosphor (4) and a yellow phosphor (6).

However, Meada and Setlur does not disclose the yellow phosphor is TbAG:Ce. Ellens teaches in Figures 3-5, a white light source, comprising: a yellow phosphor made of TbAG:Ce (see column 2, lines 41-48) for the purpose of achieving white light source having a particular has a high color rendering.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the old and well know yellow phosphor of Ellens and the blue light emitting diode of Setlur for the white light emitting device of Meada in order to achieve white light source with a particular high color rendering.

Response to Arguments

8. Applicant's arguments filed August 28, 2006 have been fully considered but they are not persuasive.

In response to Applicant's argument that the near UV light is not a blue color, the Examiner respectfully disagree. As taught by the Setlur reference the UV-to-blue ranges having a wavelength from about 315 nm to about 480 nm which lies in the claimed blue light emitting diode emitting a light having a wavelength from 400 nm to 490 nm. Thus, the Examiner interprets that the UV-to-blue light emitting diode as the claimed blue light emitting diode having a wavelength from 400 nm to 490 nm and maintains the rejection.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the claimed phosphor are old and well known in the art and each phosphor is taught by prior art used in combination with other colored phosphors to emit a white light. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the old and well known phosphors for the white light source.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (571)272-2370. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571)272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



D.D.
September 22, 2006



Nimeshkumar D. Patel
Supervisory Patent Examiner
Art Unit 2879